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**English translation of
the Japanese patent application
nr. 7-76923**

Japanese Unexamined Patent Publication No. 7-76923

Publication Date: March 20, 1995

Application No.: 5-186878

Application Date: June 29, 1993

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Title of the Invention: FLOOR MATERIAL

[Abstract]

[Object] To enable the task of joining floor material formed as a plane en echelon in a stepped form at both edges thereof to be performed easily even in tight spaces.

[Configuration] A main floor material piece A is formed by multiple rectangular boards 1 being integrally joined at the long sides thereof at offset in the length direction so as to form stepped joining planes at the edge portions thereof, wherein at one edge plane side, a tongue 2 is formed only to the sort side portion of each board 1 and a groove 3 to which the tongue 2 can fit is formed to the other edge plane side thereof, and wherein the tongue-and-groove 2 and 3 can be fit by abutting in a downward inclined manner the tongue 2 of the floor material to be laid against the groove 3 of the floor material already laid, following which the floor material is laid on the sub-floor.

[Claims]

1. A main floor material piece, comprising a plurality of rectangular boards integrally formed with the opposing side edge planes at the long sides thereof joined and with the adjacent boards being offset in a step formation in the longitudinal direction, wherein a fitting groove of a constant width is continuously provided opening upwards so as to form an outward edge wall below the side edge surface at one side edge plane of the both side edge planes of the parallel long sides of said main floor material into the form of a retaining protrusion, and a fitting protrusion portion and a retaining groove facing downwards to which said fitting groove and retaining protrusion can each fit, and wherein a tongue is provided to one short side edge plane of said rectangular boards and a groove capable of fitting with said tongue is formed at the other short side edge plane, and wherein at one side edge portion of the long side of an adjacent rectangular board which is exposed by the stepped array, a corner portion connecting with at least said tongue portion at right angles is formed as a side edge plane to which said tongue is not provided.

[Detailed Description of the Invention]

[0001]

[Industrial Field of the Invention] The present invention relates to improving floor material wherein both edge sides

are formed in a step formation.

[0002]

[Description of the Related Art]

Floor material such as shown in Fig. 13 and Fig. 14 wherein multiple rectangular boards 21 are combined en echelon with both edge planes forming a stepped joining plane is conventionally known. This joining plane is formed in an L-shaped form on both edge portions of adjacent rectangular boards 21 by the short side edge plane and the side edge plane contacting this short side at right angles, with one side of the L-shaped edge plane having a tongue 23, and the other having a groove 24.

[0003]

Floor material thus configured is installed as a floor by fitting the tongue 23 and groove 24 portions formed in a step formation and sequentially adding onto a sub-floor, but the pieces of floor material installed at right angles as to the adding direction are installed in a state of the mutually parallel long sides being simply joined, so there is the problem that gaps and offsets occur between the side edge planes, and precise installation is difficult.

[0004]

Accordingly, the Inventor of the present Application and others have developed a floor material in Japanese Patent Application No. 4-317769 configured wherein, as shown

in the above drawings, a fitting groove 30 of a constant width is continuously provided opening upwards so as to form an outward edge wall below the side edge surface at one side edge plane of the both side edge planes of the above long sides into the form of a retaining protrusion 29, and a fitting protrusion portion 26 and a retaining groove 27 facing downwards to which the fitting groove 30 and retaining protrusion 29 can each fit, thereby preventing shifting between the pieces of floor material joined in the width direction, and inhibiting gaps and offsets.

[0005]

[Problems to be Solved by the Invention]

However, in the event that the fitting groove 30 having the retaining protrusion 29, and the fitting protrusion portion 26 and retaining groove 27 are formed to both side edges as described above, the joining of the floor material pieces is restricted only to the vertical connecting direction (the longitudinal direction of the rectangular boards 21). In this case, attempting to fit the tongue 23 of the next piece of floor material to the groove 24 of the floor material already laid with the tongue 23 tilted downwards, the lower plane of the groove portion 23a protruding at the long side comes into contact with the long side upper plane 24a to which the groove of the floor material already laid has been formed, at the tongue 23 of

the adjacent rectangular boards 21 and 21, so the floor material cannot be laid down in the horizontal direction [0006]

Accordingly, there was the problem that the fitting of the next piece of floor material to the floor material already laid on the sub-floor had to be performed by laying the next piece of floor material on top of the floor material already laid down and the sliding the floor material to fit the tongue-and-groove portions 23 and 24, so in the event of installing the floor in tight spaces such as near walls or in corners, securing space for this sliding was difficult, and ease of installation was poor. It is an object of the present invention to provide floor material capable of solving such problems.

[0007]

[Means for Solving the Problems] In order to achieve the above object, according to the floor material of the present invention, a main floor material piece comprises a plurality of rectangular boards integrally formed with the opposing side edge planes at the long sides thereof joined and with the adjacent boards being offset in a step formation in the longitudinal direction, wherein a fitting groove of a constant width is continuously provided opening upwards so as to form an outward edge wall below the side edge surface at one side edge plane of the both side edge planes of the

parallel long sides of the main floor material into the form of a retaining protrusion, and a fitting protrusion portion and a retaining groove facing downwards to which the fitting groove and retaining protrusion can each fit, and wherein a tongue is provided to one short side edge plane of the rectangular boards and a groove capable of fitting with the tongue is formed at the other short side edge plane, and wherein at one side edge portion of the long side of an adjacent rectangular board which is exposed by the stepped array, a corner portion connecting with at least the tongue portion at right angles is formed as a side edge plane to which the tongue is not provided.

[0008]

[Operation] In order to install the floor material with the above construction onto a sub-floor, the tongue of the floor material to be installed next is caused to face the groove of the already-installed floor material adhered to the sub-floor beforehand in a downwards-inclined attitude, and pressing the floor material against the floor material in that state causes the side edge plane of the floor material to be laid to come into sliding contact with the side edge plane provided continuously at right angles with the groove of the floor material already laid, since the side edge at the corner continuously connected at right angles with the tongue of the floor material to be laid is

formed as a flat side edge plane to which a tongue is not provided, and accordingly, the tip of the downwards-inclined tongue is in a state of having entered the opening edge of the groove of the already-laid floor material.

[0009]

From this state, the floor material to be laid is gradually laid down in the horizontal direction and is pressed into the already-laid floor material, whereby the tongue proceeds to fit into the groove, and in the state that the floor material is in complete contact with the sub-floor, the tongue is completely fit into the groove. These procedures are followed to sequentially join and install the floor material pieces in the length direction of the floor material, following the wall.

[0010]

Next, in order to sequentially join the floor material in the width direction thereof, the floor material to be laid is inclined downwards as to the fitting groove of the upwards opening having the retaining protrusion erected at the one side edge plane of the already-lain floor material, and the fitting protrusion portion of the floor material to be laid is fit into the above fitting groove, and from this state the floor material is gradually laid down, whereby the retaining groove of the downwards-facing opening formed at the lower plane of the other side edge portion is engaged

with the above retaining protrusion of the already-lain floor material. As a result of sequentially installing the floor material in the width direction following these procedures, the movement in the horizontal direction between the floor material pieces is restricted by the fitting of the retaining protrusion and retaining groove, thus doing away with occurrence of gaps.

[0011]

[Embodiments] Next, describing an embodiment of the present invention, reference numeral 1 denotes a rectangular board formed of plywood, particle board, MDF, or other like material, having a constant width and constant length, and a plurality of these boards 1 (four in the Figure) are joined by the opposing long side edge planes, and sequentially shifted in the length direction by a certain amount to form a step formation, and in this state the joined edge planes are integrally fixed using an appropriate adhesive agent, thereby forming main floor material pieces A arrayed en echelon on a plane.

[0012]

On both short side edge planes of each of the boards 1 making up the main floor material piece A, a tongue 2 is formed over generally the entire width at the center portion of one edge plane in the thickness direction, and a groove 3 to which the tongue 2 can be fit is formed over the entire

width at the center portion of the other edge plane in the thickness direction. Also, one side of the long side edge plane of the adjacent boards 1 and 1 exposed due to offsetting the boards 1 so as to make a stepped formation is formed into a smooth side edge plane 1a to which a tongue 2 is not provided, and at the long side portions of the boards 1 and 1 positioned on the outmost side in the formation of the main floor material piece A, a protrusion 4 continuously connected to the above tongue 2 at right angles is formed on one board 1 forming one side edge plane of the main floor material piece A over the entire length, and a groove 5 continuously connected to the above groove 3 at right angles is formed on the other board 1 forming the other side edge plane of the main floor material piece A over the entire length thereof. Further, the area between this groove 5 and the lower plane of the board 1 is formed into a fitting protrusion portion 6, and a retaining groove 7 opening downwards is provided at the center portion of the lower plane of the board 1 over the entire length thereof.

[0013]

Applied to the lower plane of the main floor material piece A is an elastic backing material 8 formed of rubber, and elastic resin sheet, etc., having a certain thickness. This elastic backing material 8 is applied to the bottom face of the main floor material piece A such that one edge

thereof is flush with the inner edge of the retaining groove 7, and the other edge is extended from the lower plane of the main floor material piece A by a predetermined width and a rod-shaped retaining protrusion 9 formed of an appropriate hard material such as wood or like material is fixed thereto. Then, a fitting groove 10 opening in the upwards direction is formed over the entire length between this retaining protrusion 9 and the other side edge plane of the main floor material piece A. The retaining protrusion 9 and the fitting groove 10 are each formed at positions to which the above retaining groove 7 and fitting protrusion 6 formed on the one side edge portion of the main floor material piece A can fit.

[0014]

Describing the installation procedures of the floor material thus configured onto the sub-floor B, first, as shown in Fig. 3 and Fig. 4, the tongue portion 2 side of the floor material to be installed next is inclined downwards and caused to face the groove 3 side of the floor material forming a stepped form and already laid down, and in this state, the material is abutted against the floor material, whereby the side edge plane 1a of the floor material to be laid can be slidably brought into contact with the long side other side edge plane of formed in a stepped formation on the floor material already laid, since the long side one

side edge plane formed in a stepped formation on the adjacent boards 1 and 1 is formed as a perpendicular side edge plane 1a to which the tongue 2 has not been formed, and accordingly, the tip of the tongue inclined downwards can be brought into a state of being abutted against the opening edge of the groove 3.

[0015]

From this state, the floor material to be installed is gradually laid down in the horizontal direction and pressed toward the floor material already laid down, whereby the tongue 2 proceeds to fit into the groove 3, such that the floor material is applied onto the sub-floor and is in a horizontal state, wherein as shown in Fig. 5, the tongue-and-groove 2 and 3 are completely fit one to another. Following such procedures, the floor material is sequentially joined and installed in the length direction along the wall edge on the sub-floor B. In this state, the fitting groove 10 having the retaining protrusion 9 protruding from the other side edge portion of the main floor material piece A is continuously connected in a linear form. Incidentally, the floor material can be fixed on the sub-floor simply by laying thereupon, but also may be fixed more firmly by using adhesive agents on the lower plane thereof, or by nailing.

[0016]

Next, in order to sequentially join the floor material in the width direction, as shown in Fig. 6, the floor material to be installed is inclined downwards toward the upward facing fitting groove 10 having the retaining protrusion 9 protruding from the one side edge portion of the floor material and the fitting protrusion 6 provided on the other side edge play is fit into the fitting groove 10, and from this state the floor material is gradually laid down and pressed in, whereby as shown in Fig. 7, the groove 5 of the floor material to be laid fits with the protrusion portion 4 of the floor material already laid, and the retaining groove 7 opening downwards that is formed at the other side edge at the lower side of the plane engages with the retaining protrusion 9, thereby allowing installation wherein shifting is prevented and gaps do not occur. Further, the fitting of the protrusion 4 and groove 5 restrict movement in the vertical direction, so there are no offsets, and in addition, small roughness on the surface of the sub-floor B is absorbed by the elastic backing 8 applied to the lower side of the main floor material pieces A, enabling a floor with a flat surface to be installed.

[0017]

Fig. 8 and Fig. 9 illustrate a variation of the main floor material pieces A, and though in the above embodiment, the rectangular boards 1 forming the main floor material

piece A were joined with an adhesive agent 11 and integrally formed, but with this variation, the opposing boards 1 and 1 are provided with a protrusion portion 14 and recession portion 15, and fitting the protrusion portion 14 with the recession portion 15 forms the main floor material piece A. Other configurations are the same as those in the above embodiment.

[0018]

Fig. 10 illustrates another embodiment of the floor material according to the present invention. Though in the above embodiment, a plurality of rectangular boards 1 are sequentially shifted in the length direction by a certain amount to form a step formation of the edges of the main floor material pieces A, but according to the present embodiment, a plurality of rectangular boards 1 having a constant width and constant length are sequentially shifted in differing length directions by desired amounts to form a battlement-like formation of the edges of the main floor material piece A. Other configurations and installation procedures are the same as those in the above embodiment.

[0019]

Also, though in the above embodiment, the one long side edge plane on the adjacent boards 1 and 1, i.e., the exposed side edge plane 1a contacting the tongue 2 at right angles is of a configuration wherein the tongue 2 has not been

formed thereupon at all over the entire length, but with an arrangement wherein the tongue 3 is done away with at the tip of the exposed side edge plane 1a at least, i.e., at the corner portion coming into contact with the tongue portion 2 at right angles, the above vertical connecting installation can be performed for fitting the neighboring tongue-and-groove 2 and 3 portions together for installation.

[0020]

For such a configuration, for example, as shown in Fig. 11, at the exposed side edge plane 1a connecting at right angles to the tongues 2 provided on the short sides of the neighboring rectangular boards 1 and 1, a portion of an appropriate length from the corner is formed as a perpendicular plane to which a tongue 3 is not provided, or, as shown in Fig. 13, the edge portion of the protrusion portion whereby the boards 1 and 1 are fit may be formed as an inclined edge portion 14a which gradually becomes narrower toward the corner.

[0021]

[Advantages] According to the floor material of the present invention thus described, a main floor material piece comprises a plurality of rectangular boards integrally formed with the opposing side edge planes at the long sides thereof joined and with the adjacent boards being offset in a step formation in the longitudinal direction, wherein a

tongue is provided to one short side edge plane of the rectangular boards and a groove capable of fitting with the tongue is formed at the other short side edge plane, and wherein at one side edge portion of the long side of an adjacent rectangular board which is exposed by the stepped array, a corner portion connecting with at least the tongue portion at right angles is formed as a side edge plane to which the tongue is not provided, so at the time of joining the floor material to be laid next to the floor material already laid, the floor material can be inclined downwards and in this state the tongue and the groove can be abutted, so lowering the floor material downwards from that state so as to be laid on the floor allows the floor material to be easily and precisely joined.

[0022]

Accordingly, there is no need to slide and move the floor material to be installed as to the already-lain floor material from a position distanced in the length direction as with the conventional technique, so installation can be easily made in tight spaces such as along walls or in corners, meaning that floor installation can be performed efficiently.

[0023]

Further, according to the floor material of the present invention, a fitting groove of a constant width is

continuously provided opening upwards so as to form an outward edge wall below the side edge surface at one side edge plane of the both side edge planes of the parallel long sides of the main floor material into the form of a retaining protrusion, and a fitting protrusion portion and a retaining groove facing downwards to which the fitting groove and retaining protrusion can each fit, so in the event of sequentially joining the floor material in the width direction, the floor material to be installed next is inclined downwards toward the fitting groove facing upwards having the retaining protrusion erected on one edge plane of the floor material already laid, and the fitting protrusion portion provided to the other side edge plane thereof is fit into the above fitting groove, and from this state the floor material is gradually laid down, whereby the downward facing retaining groove formed on the lower plane of the other side edge portion is easily engaged with the retaining protrusion of the floor material already laid, and the movement between the floor material pieces in the width direction is thus restrained, so gaps can be prevented from occurring, and floor installation can be precisely performed.

[Brief Description of the Drawings]

[Fig. 1] Fig. 1 is a plan view of the floor material according to the present invention.

[Fig. 2] Fig. 2 is an enlarged cross-sectional frontal view

thereof.

[Fig. 3] Fig. 3 is a plan view illustrating the state of longitudinal installation.

[Fig. 4] Fig. 4 is a cross-sectional side view thereof.

[Fig. 5] Fig. 5 is a plan view illustrating the joined state.

[Fig. 6] Fig. 6 is a simplified cross-sectional frontal diagram illustrating the state of width-wise installation.

[Fig. 7] Fig. 7 is a simplified cross-sectional frontal diagram illustrating the junction thereof.

[Fig. 8] Fig. 8 is a plan view illustrating a variation of the floor material.

[Fig. 9] Fig. 9 is a cross-sectional frontal diagram of line X-X therein.

[Fig. 10] Fig. 10 is a plan view illustrating another embodiment of the floor material.

[Fig. 11] Fig. 11 is a disassembled plan view illustrating yet another embodiment of the floor material.

[Fig. 12] Fig. 12 is a disassembled plan view illustrating a variation thereof.

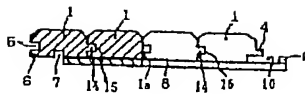
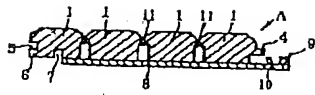
[Fig. 13] Fig. 13 is a plan view illustrating a conventional example.

[Fig. 14] Fig. 14 is a cross-sectional frontal diagram thereof.

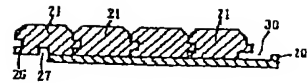
[Reference Numerals]

- 1 Board
- 1a Side edge plane
- 2 Tongue
- 3 Groove
- 6 Fitting protrusion portion
- 7 Retaining groove
- 9 Retaining protrusion
- 10 Fitting groove

【図 9】



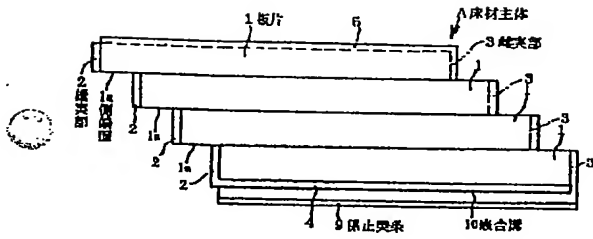
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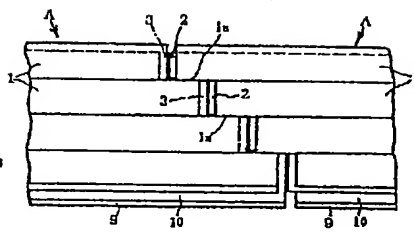
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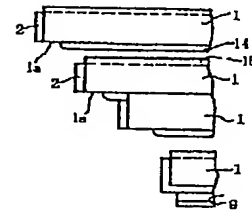
【図 1】



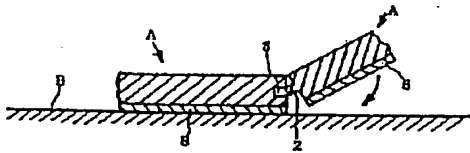
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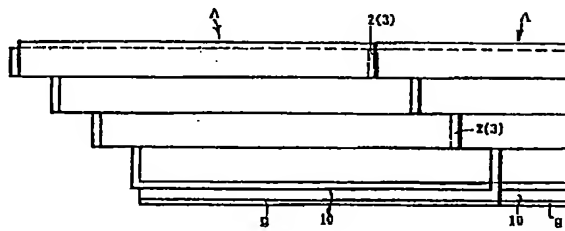
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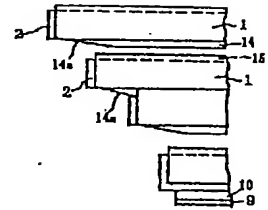
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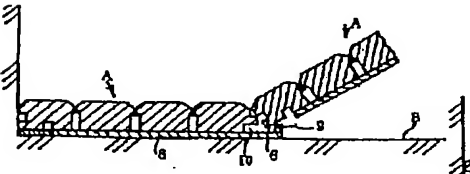
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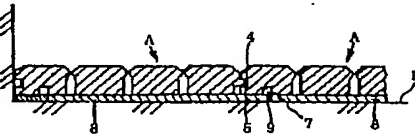
【図 12】



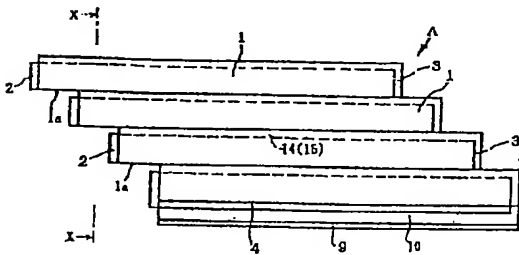
【図 6】



【図 7】



【図 8】



【図 10】



【図 13】

